TITLE OF THE INVENTION:

Apparatus for connecting and anchoring tarpaulins

FIELD OF THE INVENTION

The present invention relates to an apparatus for connecting and anchoring tarpaulins, with particular applicability to securing tarpaulins to scaffolding.

BACKGROUND OF THE INVENTION

Canadian Patent 2,359,515 (Layfield 2001), owned by the Layfield Group, describes an apparatus for connecting and anchoring tarpaulins which has an elongate body with a first side, a second side, and a longitudinal axis. The elongate body has a first connector and a second connector. The first connector extends parallel to the longitudinal axis facing the first side. The second connector extends parallel to the longitudinal axis facing the second side. Anchoring wings protrude past the first side and the second side. Openings are placed in the anchoring wings to receive fasteners. As described in the Layfield '515 patent, the use of the term "tarpaulin" is intended in the broadest sense.

The Layfield '515 patent has been produced commercially as an inexpensive polymer plastic extrusion and has attained a measure of commercial success. However, products made in accordance with the teachings of the Layfield '515 patent experienced some unanticipated failures when exposed to high winds. In this context, the term "high winds" refers to winds in excess of 50 kilometers per hour (30 miles per hour). The tarpaulin secured to scaffolding acts like a sail and captures the wind. The high winds exerted such force that it caused ties, used to secure the body to scaffolding, to pull through and destroy the anchoring wings. If there was any slack in the ties, the high winds caused the body to slap violently against the scaffolding; resulting in cracks and eventual failure where the first wing and the second wing join the body.

The problem was taken to the extrusion company doing the polymer plastic extruding for The Layfield Group. The extrusion company indicated that the problem could not be solved merely by thickening the low cost polymer plastic extrusion. Their recommendation was to use alternative materials, such as aluminum or undertake a redesign of the apparatus. The use of aluminum would make the apparatus too expensive for the intended market. The Layfield Group, therefore, had no alternative but to undertake a redesign of the apparatus for connecting and anchoring tarpaulins. The inability to use the design described in the Layfield '515 patent, in applications which might become exposed to high winds, eliminated too large a segment of the market.

SUMMARY OF THE INVENTION

What is required is an apparatus for connecting and anchoring tarpaulins which can function without failure in high winds.

According to the present invention there is provided an apparatus for connecting and anchoring tarpaulins, which includes a polymer plastic elongate body having a first end, a second end, a first side, a second side, and a longitudinal axis. An integrally formed first connector extends parallel to the longitudinal axis for the entire length of the elongate body from the first end to the second end. The first connector has an opening facing the first side. The first connector is adapted to receive and retain a first bulbous edge of a first tarpaulin. An integrally formed second connector extends parallel to the longitudinal axis for the entire length of the elongate body from the first end to the second end. The second connector has an opening facing the second side. The second connector is adapted to receive and retain a second bulbous edge of a second tarpaulin. An integrally formed first anchoring wing underlies the elongate body and extends from the first end to the second end. The first anchoring wing has a first side and a second side. The first side of the first anchoring wing protrudes past the first side of the elongate body. The second side of the first anchoring wing merges into a vertical plane positioned along the longitudinal axis of the elongate body. An integrally formed second anchoring wing underlies the elongate body and extends from the first end to the second end. The second anchoring wing has a first side and a second side. The first side of the second anchoring wing protrudes past the second side of the elongate body. The second side of the second anchoring wing merges into the vertical plane.

The problem with failures of the wings was resolved by having the wings underlie the main part of the body and merge into a vertical plane positioned on the longitudinal axis of the body. In this way the wings were better integrated with the main body and less prone to cracks that there were with a single point of attachment.

As will hereinafter be further described, the first anchoring wing and the second anchoring wing were also made of a thicker polymer plastic than the first connector and the second connector.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

FIGURE 1 is a perspective view of an apparatus for connecting and anchoring tarpaulins constructed in accordance with the teachings of the present invention.

FIGURE 2 is an end elevation view in section of the apparatus illustrated in **FIGURE 1**.

FIGURE 3 is a top plan view of the apparatus illustrated in **FIGURE 1** in use securing tarpaulins to scaffolding rosettes.

FIGURE 4 is a top plan view of the apparatus illustrated in **FIGURE 1** in use securing tarpaulins to scaffolding tubing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, an apparatus for connecting and anchoring tarpaulins, generally identified by reference numeral 10, will now be described with reference to **FIGURES 1** through **4**.

Structure and Relationship of Parts:

Referring to **FIGURE 1**, apparatus 10 has a polymer plastic elongate body 12 having a first end 14, a second end 16, a first side 18, a second side 20, and a longitudinal axis 22. An integrally formed first "C" channel connector 24 extends parallel to longitudinal axis 22 for the entire length of elongate body 12 from first end 14 to second end 16. Referring to **FIGURE 2**, first "C" channel connector 24 has a slotted opening 26 facing first side 18. Referring to **FIGURE 3**, first "C" channel connector 24 is further adapted to receive and retain a first bulbous edge 28 of a first tarpaulin 30. Referring to **FIGURE 1**, an integrally formed second "C" channel connector 32 extends parallel to longitudinal axis 22 for the entire length of elongate body

12 from first end 14 to second end 16. Referring to **FIGURE 2**, second "C" channel connector 32 has a slotted opening 34 facing second side 20. Referring to **FIGURE 3**, second "C" channel connector 32 is further adapted to receive and retain a second bulbous edge 36 of a second tarpaulin 38. Referring to **FIGURE 1**, an integrally formed first anchoring wing 40 underlies elongate body 12 and extends from first end 14 to second end 16. Referring to **FIGURE 2**, first anchoring wing 40 has a first side 42 and a second side 44. First side 42 of first anchoring wing 40 protrudes past first side 18 of elongate body 12. Referring to **FIGURES 1** and **2**, second side 44 of the first anchoring wing 40 merges into a vertical plane 46 positioned along longitudinal axis 22 of elongate body 12. Referring to **FIGURE 1**, an integrally formed second anchoring wing 48 underlies elongate body 12 and extends from first end 14 to second end 16. Referring to **FIGURE 2**, second anchoring wing 48 has a first side 50 and a second side 52. First side 50 of second anchoring wing 48 protrudes past second side 20 of elongate body 12. Referring to **FIGURES 1** and **2**, second side 52 of second anchoring wing 48 merges into a vertical plane 46 positioned along longitudinal axis 22 of elongate body 12. Referring to **FIGURE 2** first anchoring wing 40 and second anchoring wing 48 are angled outwardly and downwardly from elongate body 12 to define a concave engagement surface 54. Further, body 12 has a second underlying curvature 56 that is more acutely angled than concave engagement surface 54. First anchoring wing 40 and second anchoring wing 48 are further adapted with a second reinforcing ridge 58 made of thicker polymer plastic and which runs along longitudinal edges, 60 and 62, respectively. Referring to **FIGURE 1**, each of "C" channel connectors 24 and 32 at first end 14 and second end 16 has a chamfer 64 to facilitate insertion of each of bulbous ends 28 and 36 of each of tarpaulins 30 and 38 into each of "C" channel

connectors 24 and 32, as illustrated in **FIGURES 3** and **4**.

Operation:

The use and operation of apparatus for connecting and anchoring tarpaulins 10 will now be described with reference to **FIGURES 1** through **4**. Referring to **FIGURE 1**, based upon the nature and dimensions of the application, an appropriate number of apparatus 10 in appropriate lengths are provided. Referring to **FIGURE 3**, in the illustrated embodiment, where attachment to scaffolding or similar framework is required, apparatus 10 may be positioned adjacent a scaffolding rosette 66. Referring to **FIGURE 1**, based upon the determination of attachment points, appropriate holes 68 may be drilled or selected from predrilled holes 68 into first anchoring wing 40 and second anchoring wing 48. Referring to **FIGURE 3**, a strap 70 may then be fashioned to secure body 12 to rosette 66. Referring to **FIGURE 4**, in the illustrated embodiment, where attachment to scaffolding or similar framework is required, apparatus 10 may be positioned adjacent a tubing 72. Referring to **FIGURE 1**, based upon the determination of attachment points, appropriate holes 68 may be drilled or selected from predrilled holes 68 into first anchoring wing 40 and second anchoring wing 48. Referring to **FIGURE 4**, a wire 74 may then be fashioned to secure body 12 to tubing 72. It will be appreciated that various configurations of scaffolding or framework are adaptable and that other means of attachment may be used. Referring to **FIGURES 3** and **4**, apparatus 10 receives bulbous end 28 of first tarpaulin 30 and bulbous end 36 of second tarpaulin 38 at first end 14 or second end 16 as illustrated in **FIGURE 1**. Chamfer 64 assists the entry of bulbous ends 28 and 36 into first "C" channel connector 24 and second "C" channel connector 32. Referring to **FIGURES 3** and **4**, once positioned, each apparatus is interlocked with each tarpaulin, creating an expanded covering to protect or define a work space.

Referring to **FIGURE 2**, it is to be noted that concave engagement surface 54 of first anchoring wing 40 and second anchoring wing 48 matches that of a 5 inch diameter scaffolding rosette 66, as illustrated in **FIGURE 3**. Referring to **FIGURE 2**, it is also to be noted that underlying curvature 56 of body 12 matches that of tubing 72 having an outer diameter of 2 7/8, as illustrated in **FIGURE 4**. Referring to **FIGURE 3**, plastic tie straps 70 may be used. However, referring to **FIGURE 4**, due to failure of plastic tie straps 70 in more stressed situations, wire 74 may be used for attachment in demanding applications. Referring to **FIGURE 2**, reinforcing ridges 58 fortify each of peripheral edges 60 and 62 to permit attachment by wire 74, as illustrated in **FIGURE 4**, resisting breakage.

In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.